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PROVISIONAL INTELLIGENCE REPORT

INDUSTRIAL DEVELOPMENT IN THE
LAN-CHOU AREA



CIA/RR PR-55
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INDUSTRIAL DEVELOPMENT IN THE LAN-CHOU AREA

CIA/RR PR-55

(ORR Project 38.252)

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FOREWORD

The purpose of this report is to evaluate recurring reports about Chinese Communist intentions to concentrate new industrial construction in the Lan-chou area and to shift major concentrations of industry from Northeast and North China to Northwest China.

These evaluations are based upon a detailed study of the present state of industry in Lan-chou and on a review of regional geography, natural resources, manpower, transport, and power facilities. These are the factors which must provide the base for future industrial expansion in the area.

In addition, the report estimates the expected development of industries in Lan-chou during the next decade.

Accurate knowledge of economic activity in Northwest China, and particularly in the Lan-chou area, is useful because it supplies a valuable insight into the capabilities, limitations, and future intentions of the Chinese Communists. Such knowledge places in proper perspective new intelligence of a geographic shift of Chinese Communist industry. It also provides the basis for an estimate of the ability of the Lan-chou area of Communist China to absorb additional investment over a period of time and reveals the economic indicators that should be watched for clues with which to measure the rate of economic development.

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INDUSTRIAL DEVELOPMENT IN THE LAN-CHOU AREA*

Summary

There are no indications that Communist China intends to concentrate new industrial construction in the Northwest at the expense of the more mature industrial centers of the eastern provinces. Industrial expansion is not progressing at a faster rate in Lan-chou than in other regions of Communist China. Investments in Hsi-an in Shensi Province and Ti-hua in Sinkiang indicate that Lan-chou is not being singled out for any extraordinary program of industrial development.

The focus on Lan-chou is the result of (1) improvements in transportation facilities, especially the construction of the Lan-chou - Sinkiang railroad, and (2) increased petroleum production at the Yu-men oil fields, 550 miles northwest of Lan-chou. Lan-chou is, in effect, an expanding frontier city that is the focal point for railroad, highway, and river transportation throughout Northwest China.

The modest industrial expansion in Lan-chou is designed to support the exploitation of the Northwest's natural resources, the increase of agricultural production, and the manufacture of consumer goods for local populations rather than to effect a major contribution to Communist China's total requirements for the products of engineering industries.

Industrial production in Lan-chou does not constitute a significant contribution to any sector of Communist China's aggregate industrial production. This judgment is supported by the lack of the electric power, plant facilities, productive equipment, raw materials, and technical personnel required to manufacture engineering products at more than handicraft levels of production. The present level of technology is limited to the production of spare parts for vehicle repair, the manufacture of simple agricultural implements, the repair

* The estimates and conclusions contained in this report represent the best judgment of the responsible analyst as of 15 March 1954.

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and manufacture of simple wool textile machinery, and the manufacture of consumer goods.

A small-scale metallurgical industry, designed to meet partial local requirements, may be established in Lan-chou within the next 5 years. A shortage of coking coal makes unlikely a large-scale metallurgical industry in the area.

With the possible completion of the Lan-chou - Sinkiang railroad by 1960, Lan-chou will be in a position to receive raw materials and industrial products from the coastal provinces to the east and from Sinkiang and the USSR to the west, and commercial activity in the Lan-chou area will expand greatly. The effect of continued improvements in irrigation, reforestation, agriculture, and exploitation of natural resources should have a considerable impact on Northwest China by 1960. Plants in Lan-chou should then be capable of producing in job-shop quantities such items as water pumps, air compressors, textile machinery, metal-cutting equipment -- including lathes and shapers of nonprecision varieties, equipment for both the mining and petroleum industries, and large quantities of agricultural tools and farm machinery. Major emphasis is expected to be on light industry, and it is likely that a major woolen textile industry will be established.

This report suggests that as a result of improved road and rail transport, of greatly increased natural resource exploitation, and of increased availability of electric power, the importance of Lan-chou as an industrial, commercial, and transportation center will increase greatly during the next 10 years.

The stress placed upon railroad construction, petroleum exploitation, and electric power installations will continue to serve as indicators for evaluating the rate of industrial growth in the Lan-chou area.

I. Economic Development in Lan-chou.

A. Importance.

Lan-chou, the capital of Kansu Province, is in the remote interior of Communist China on the historic "silk route" between China

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and the countries of Europe. It is situated at the eastern entrance to the Kansu corridor, the only practical highway and railroad route to Sinkiang and Soviet Central Asia. Lan-chou is approximately 850 airline miles west of Shanghai; 650 miles south of Ulan-Bator, the capital of Mongolia; and 1,200 miles east of Alma-Ata.*

Since 1950, reports from the Chinese mainland have confirmed the modest industrialization that is taking place in Lan-chou. Indeed, many of these reports greatly overplay the growing industrial importance of Lan-chou and the short-run industrial importance of Northwest China. Generalities claiming that the center of gravity for Communist China's industry has been shifting to Lan-chou 1** are not supported by the past industrial capabilities of Lan-chou; recent industrial activity in Lan-chou; industrial construction in Hsi-an, 2/
in Shensi Province, and in Ti-hua, in Sinkiang 3/
and the dispersed industrial activity in Northeast, North, and East China.

Reports of residential, commercial, and military construction in Lan-chou were widespread during 1951 and 1952. This construction and renovation was designed to divide the city into distinct industrial, cultural, and residential areas. 4/

B. Economic Planning.

Since 1950, Chinese Communist sources have provided evidence that economic planning for the Northwest was facing the normal difficulties encountered by lack of experience. Chinese Communist reports regarding the general industrialization of Lan-chou have been expansive, but they have shown reticence in detailing industrial activities in the area. The industrial expansion of Lan-chou, according to Chinese Communist reports, was to include the construction of power plants, modern farm-tool factories, plants for the production of equipment for the petroleum industry, fertilizer plants, chemical plants manufacturing daily necessities, and wool-weaving and processing plants. 5/

Intermixed with the broad generalities of these Chinese Communist reports has been an awareness of the difficulties involved in industrializing Northwest China. Chinese Communist official statements, when reviewed successively, reveal the government admitting inferior production, poor management, and faulty planning. The statements further indicate that attempts to correct some of these problems have, on occasion, created additional confusion. 6/

* See the map, Communist China: Northwest Area, inside back cover.
** Footnote references in arabic numerals are to sources listed in Appendix D.

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Plans for Kansu Province for 1951 included improvement of existing mines and factories, establishment of "democratic" management, and improvement of auditing procedures. The extremely modest scope of activities is indicated by a review of specific projects planned for 1951. These included the equipping of the Lan-chou Flour Mill with 4 additional grist mills and an additional wheat-washing machine, the expansion of the cement production by 700 metric tons annually, additional exploitation of raw materials, and the construction of a small dam near Lan-chou for the building of a small hydroelectric power station. 7/ In 1951, Chinese Communist statements claimed that industrial investment in Northwest China was to be 18 percent of the total industrial investment in Communist China, resulting in a doubling of the industrial capital in this area by the end of 1951. 8/

Production goals for 1952 called for increases in the output of coal, power, and cement. In addition, goals for that year included increased production efficiency in existing plants; more thorough adoption of business accounting methods and inventory systems; suggestions from workers to improve production; a higher rate of capital turnover; and better quality of products along with increased quantities, lower production costs, and less waste. 9/

Early in 1952, full-scale 3-Anti* and 5-Anti campaigns were waged to expose cases involving "corruption, waste, and bureaucracy." At the end of 5 months the campaigns reportedly held in check "bribery, embezzlement, tax evasion, fraud in construction projects, and the stealing of state economic intelligence." Official reports on economic activities in Northwest China admit that, with the cadre engaged in the 3-Anti campaign and industry and commerce engaged in the 5-Anti campaign, serious economic repercussions resulted. Production decreased, trade between the cities and villages was disrupted, and many handicraft and agricultural products could not find markets. 10/ Unemployment was prevalent. 11/

* The "3-Anti" and "5-Anti" campaigns were Chinese Communist Party campaigns of "voluntary" self-criticism and confession of sins, stimulated by subordinates informing on superiors and neighbor informing on neighbor. The "3-Anti" campaign concerning governmental personnel was directed toward removing the three "vices" of waste, corruption, and bureaucracy. The "5-Anti" campaign was directed toward eliminating the five "vices" of bribery, fraud, profiteering, tax evasion, and the theft of state economic secrets.

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The economic condition became serious enough to cause the government to call back for regular assignment between 30 and 50 percent of the cadres engaged in the 3-Anti movement. 12/

Throughout the year the Chinese Communists exerted considerable effort to increase trade in Northwest China. Each locality was required to hold at least one so-called Goods Exchange meeting prior to the end of 1952. 13/

In August 1953, the Northwest Committee on Financial and Economic Affairs stated that production goals for the first half of 1953 for 97 state-operated and privately operated factories and mines had failed to meet planned production goals, although these firms supposedly reached 98.95 percent of the production goal in terms of total value of output. 14/ Chinese Communist claims of the achievements of individual segments of industry in Northwest China are given in Table 1.

Table 1

Chinese Communist Claims of Industrial Achievement
in Northwest China 15/
First Half of 1953

<u>Industry</u>	<u>Percent of Goal Achieved <u>a/</u></u>
Petroleum	102.04
Electric Power	101.71
Machinery	93.00
Textiles	99.64

a. In terms of total value of output, June production estimated.

Of 48 industrial plants in Northwest China, only 6 fulfilled all of the 5 monthly plans from January to May. The problems hampering industrial production continued to be poor management, lack of adherence to government directives, poor planning at the plant level, and a "failure to mobilize the working masses" and gain their full cooperation. No hint of the inadequacy of basic governmental planning or operation was given. 16/

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C. Industrial Transfers and New Construction.

Since 1951 there have been frequent reports of industrial firms being transferred from the coastal regions to the Northwest and Lan-chou. These reports included the transfer of the First Plant of the Shanghai Government Machine Manufacturing Plant, 17/ a portion of the Mukden Automobile Manufacturing Plant, 18/ and the East China Pharmaceutical Manufacturing Company. 19/ Additional automotive repair facilities were also reported transferred to Lan-chou during this period. 20/ One report claimed the establishment of automotive manufacturing and aircraft assembly plants in Lan-chou. 21/

Reports of the transfer of plants to the Lan-chou area have been vague and have contained little information on the types and number of machines sent to Lan-chou for the establishment of automotive repair facilities. The Mukden plant was dismantled by the Russians in 1945 and has never resumed automotive production. Activities in Mukden were restricted to automotive repair and the manufacture of spare parts. 22/ Similar activities in Lan-chou would appear likely.

The establishment of modern, expanded automotive repair facilities in Lan-chou is a logical development planned to meet the demands of growing truck traffic throughout Northwest China. In addition, the war in Korea undoubtedly served as an incentive for the Chinese Communists to strengthen their lines of communication with the USSR. The reported establishment of an aircraft assembly plant in Lan-chou, however, is not realistic in view of the industrial background of this area and the shortages of power, materials, and skilled labor.

A T'ai-pei report in May 1952 claimed that a napalm bomb plant was to be constructed in Lan-chou. 23/ There is no confirmation of this report beyond the general availability of petroleum products and a reported chemical warfare school in Lan-chou. 24/ Because of the relative ease of manufacture of the napalm bomb, it is difficult to evaluate the validity of the report.

Construction of a major automotive repair shop in Lan-chou was reportedly begun in October 1951 at a site southeast of the Lan-chou airfield. 25/ It is probable that this plant is now in operation.

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A modern textile plant is presently being constructed in Lan-chou. The plant is scheduled to contain facilities for wool washing, combing, weaving, and dyeing. The plant, located in the western suburbs of Lan-chou, was to be completed by 1954. 26/ This plant, like the automotive repair plants, is well suited to an industrial expansion program in Lan-chou.

A large sulfuric acid plant is reported under construction in Lan-chou and is supposedly scheduled for completion by October 1954. 27/ Additional reports have indicated the construction in Lan-chou of either a nitric acid plant or a sulfuric acid plant, or both. 28/ Small quantities of nitric and sulfuric acid were produced in Lan-chou as early as 1944, an indication that available facilities may have been greatly expanded. 29/

The new cement factory in Lan-chou has proved inefficient. The plant has been singled out by the Chinese Communists as an example of poor planning and bad management. Actually, adequate supplies of limestone have not been available for full-scale production, and the completion of the Lan-chou railroad permitted cement from the eastern plants to be sold cheaper than the local product. 30/

Other reported construction activity in Lan-chou supporting the industrialization of that city has included railroad yard and petroleum storage facilities. 31/ The Chinese Communist radio has also claimed that an oil refinery was to be established in Lan-chou or adjacent localities. 32/ There has been no confirmation of the construction of an oil refinery in Lan-chou, and because of its distance from the Yu-men oil fields to the northwest and the major consumption centers to the east, it is doubtful whether Lan-chou offers a particularly high potential as an oil refinery center.

II. Industrial Structure of Lan-chou.

A. Industrial Organization.

A study of industry in Lan-chou does not show a large, complex industrial organization. Rather, the industrial capabilities of Lan-chou must be related to individual plants with motors totaling 135 horsepower, and to semihandicraft machinery plants of 20 workers, a lathe, a vise, and a forge. 33/

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Industries in Lan-chou do not make a substantial contribution to any sector of Communist China's aggregate industrial production. When compared to Western concepts of industrial significance, the future industrialization of Lan-chou is starting from a practically nonexistent base. A study of Lan-chou, however, reveals considerable information regarding the industrial capabilities and limitations of a remote Chinese city. Considering the limitations in power, equipment, and raw materials, the plants in Lan-chou show a high degree of self-sufficiency. These factories are the "bailing wire" holding together a backward, regional economy and are the base which must support the future industrial growth of Lan-chou.

Much of the substantive material describing industries in Lan-chou dates back to 1944-45. In the immediate postwar period, however, there was little industrial activity in Lan-chou. ^{34/} The industrial eastern provinces, freed of the Japanese, were in the industrial lime-light, and the civil war in China further disrupted economic conditions in the Northwest. The Kansu Machinery Plant, the largest plant in Lan-chou, did not resume full production prior to 1950. ^{35/} Because of these conditions, the "bench mark" picture of Lan-chou for 1944-45 is valid for as late a period as 1950 and 1951.

B. Production Facilities.

1. Machinery and Metalworking. ^{36/}

In 1945 the Kansu Machinery Plant, operated jointly by the National Resources Commission and the Kansu provincial government, and the Lan-chou Machinery Plant were the only two industrial plants in Lan-chou that contained sufficient metal-processing tools and equipment to manufacture complicated engineering-industry products. Of these two plants, only the Kansu Machinery Plant approached a small modern industrial plant in either size or productive capabilities. Production was geared essentially to "job-shop" production methods rather than to large-quantity production of particular items.

The extensive plans for this plant were never realized, although the factory included a machine shop, a foundry, a forge, and repair shops. Products of the plant included lathe beds, shapers, hydraulic presses, air compressors, steelyards, and various other types of selected machinery. Production was never satisfactory, either in quality or in quantity, although many of the plant difficulties were

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undoubtedly caused by a lack of adequate supply and by inferior raw materials: The plant contained 18 motors totaling 135 horsepower.

The Lan-chou Machinery Plant was the second largest industrial plant in Lan-chou. Equipment was extremely limited, consisting of 1 shaper, 3 drills, 1 arc welding machine, 7 engine lathes, 3 planers, and 4 motors totaling 35 horsepower. The items manufactured were used primarily for the repair of the flour mill and chemical works belonging to the same company and as spare parts for textile mills.

In addition, there were in Lan-chou 25 additional plants considered to be machinery and metalworking plants. The equipment of these plants was extremely limited, consisting in many instances of "1 drill press, 1 hand drill, 2 vises, and a forge." Such establishments specialized in automotive and machinery repair operations and in the manufacture of such items as cotton scutchers, wool combers, and simple castings. The ingenuity of these small-scale producers was high, as is often the case in areas of the world characterized by low levels of modern industrial capacity and technology. Small producing units with a minimum of mechanical power, material, and machinery were capable of duplicating many of the more complicated items of Western technology. The total output of such plants can be considerable. Such producing units, however, are not capable of either the engineering design function and precision operations in terms of both raw materials and processing or large-scale production of particular items. Production is geared to local needs. The primary purpose of many of these small-scale plants is to keep the textile, food-processing, and other industrial, military, and transport operations functioning.

The eight major metalworking and machinery plants operating in Lan-chou in 1944 are listed in Appendix A together with data on equipment, production, capitalization, labor force, and location.

2. Metallurgical. 37/

The iron foundries in Lan-chou were capable of only limited production of poor-quality cast iron. Although the two major machinery plants, the Kansu Machinery Plant and the Lan-chou Machinery Plant, use cupolas in their foundry production, the other foundries in Lan-chou were dependent upon small crucibles producing iron products suitable for tools, plowshares, stove grates, and shovels.

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In the production of crucible iron, several dozen clay crucibles are placed in a horizontal furnace and fired by coal placed beneath and around the crucibles. Hand-operated or, in a few cases, power-operated bellows supply air for the furnace. The heating process requires from 3 to 9 hours to prepare the metal for pouring.

The amount of iron that can be poured at any one time is relatively small, and a high-grade product is not possible, because high temperature cannot be obtained. The crucibles can be used only once, and they often break during the firing process.

3. Electrical. 38/

In 1941 the Lan-chou Branch of the Fourth Factory of the Central Electric Equipment Company was established in Lan-chou. Production consisted of various types of flashlight batteries and A, B, and C batteries for radio and telecommunications use.

Originally located in Shanghai, the Central Electric Equipment Company manufactured dry cell batteries, under the trade name of "Sun and Moon," which were widely used throughout China. Because of the evacuation of the coastal provinces, a number of battery plants operated by this company were relocated throughout the interior provinces.

Operations in Lan-chou were hampered by inadequate supplies of materials. Securing sufficient quantities of carbon and ammonium salts proved to be a major problem, and distant sources in Ningsia and Sinkiang were exploited.

The electric battery industry in Lan-chou was a wartime expediency. Lan-chou is located far from the major chemical industries that can best service the requirements of a battery industry. No information is available regarding the output of this plant since 1950, and it is doubtful whether the plant is presently engaged in battery production. In 1944 the plant was reported to have 1,136 square meters of floor space and to employ 154 workers.

4. Military End Items. 39/

One small arsenal is known to have been located in the northern suburbs of Lan-chou. This arsenal is presently reported to be engaged in the repair of weapons. Considering the productive

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capacity of Lan-chou, it would appear likely that work is limited to the repair of weapons or the production of simple spare parts.

5. Nonengineering Industry Production. 40/

Plants in Lan-chou, both handicraft and semimodern, have been engaged, for the most part, in the production of consumer goods to fulfill regional demands. Production has included textiles, mainly woolens -- including military blankets and clothing, leather goods, glassware, flour, paper, chemicals, matches, printing supplies, cigarettes, bricks, and small quantities of cement. The great majority of these plants were of the family, or semihandicraft, variety, solely dependent upon handpower.

C. Industrial Base.

1. Raw Materials.

The mineral resources of Northwest China are considerable in both variety and total reserves, and large sections of the area remain geologically unexplored. Gross estimates of reserves in Northwest China vary greatly for individual resources, emphasizing the incomplete nature of geological work in the area.

The Chinese Communists have placed considerable emphasis upon the large number of prospecting teams presently surveying the Northwest area, but statements regarding the results of these surveys have been limited to claims of discovering large deposits of copper in Kansu, rare bornite in Shensi, chromium in Ningsia, extensive coal deposits, and reserves of manganese, bismuth, zinc, and beryllium. 41/

In addition to large reserves of iron and coal, Northwest China is known to contain deposits of manganese, wolfram, gypsum, lead, silver, gold, bauxite, sulfur, borax, nitrate, and graphite. 42/ Uranium deposits are reportedly widespread throughout Sinkiang, 43/ but detailed information on the great majority of these uranium deposits is not available. Although reserves of iron and coal are extensive, actual production in Northwest China has not been of national importance. For example, prior to 1950 the annual primitive production of pig iron in south Kansu did not exceed 1,000 metric tons. 44/ The consumption of iron by the major users in Kansu is given in Appendix A.

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Coal is available in the immediate vicinity of Lan-chou, but grades suitable for coking purposes are scarce. Available local coke has a low thermal value and is generally unsatisfactory for metallurgical use. 45/

Although the Chinese Communists have noted that production of the cement factory in Lan-chou has been hampered by unavailability of limestone, geological formations of limestone are common throughout southern Kansu. 46/ Fluorspar is locally available and is used as a flux in smelting iron. 47/

Present exploitation of petroleum in Northwest China is restricted to the Yu-men oil fields in Kansu and the fields in the vicinity of Wu-su in Sinkiang. Although undeveloped petroleum reserves cover extensive areas throughout Kansu and Sinkiang, present (1954) production of the Yu-men refinery is estimated at only 400,000 metric tons annually, which accounts for approximately 25 percent of the total mainland requirements of Communist China. 48/

Petroleum products from the Yu-men oil fields are presently being transported by tank trucks, and by oil drums loaded on trucks, from the oil fields to the railhead in the vicinity of Yung-teng. The first shipment of crude oil to a refinery in East China was reported in late 1953. 49/

Petroleum production in Sinkiang is small at present and has little relationship to the immediate industrialization of Lan-chou. Until the completion of the Lan-chou - Sinkiang railroad, petroleum production in the Sinkiang area will remain oriented toward the USSR and local uses.

2. Industrial Manpower.

Recurrent reports of an explosive increase in the population of Lan-chou have been responsible for focusing increased attention on the area.

In 1943 the total population of Lan-chou and Kaolan Hsien was 277,572. 50/ In 1952 the Northwest Daily News fixed the population of Lan-chou at 698,000. 51/ Other expansive statements from Communist China have predicted that the population of the city will reach 1 million 52/ to 4 million 53/ within the next few years.

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Such an increase in the population of Lan-chou is not indicated by recent population movements in Northwest China. There have been reports of some voluntary and some forced migration from the coastal provinces as a result of the 3-Anti and 5-Anti movements. 54/ Railroad construction, irrigation projects, industrial expansion, and increased petroleum and mineral exploitation have all increased demands for labor in Northwest China. The most pressing demands, however, have been for technical workers and skilled and semiskilled personnel. Reports of transfer of technical workers to the Northwest have been recurrent, 55/ but the scope of these transfers has been modest and is not indicative of wholesale transfers of industrial facilities.

In 1944, only 2 percent of the population of Lan-chou was engaged in manufacturing. The total labor force in Lan-chou during this period consisted of 3,383 workers. Fewer than 800 workers were employed in the metalworking plants, including handicrafts. 56/

Soviet advisers have been reported in Lan-chou since 1950, 57/ estimates of their numbers varying from a "small group" 58/ to over 200. 59/ The Russians are in Lan-chou reportedly to support construction activities, to supervise Sino-Soviet air traffic, and to act as technical advisers in at least one industrial plant. 60/ In addition, the Yu-men oil fields 61/ and the construction of the Lan-chou railroad have received Soviet technical assistance. 62/

3. Electric Power.

During World War II the electric generating capacity in Lan-chou totaled 974 kilowatts, divided between 1 turbine of 500 kilowatts and 1 steam unit of 474 kilowatts. 63/

Since 1950, several piecemeal attempts have been made to increase electric generating capacity in Lan-chou. An additional 1,000 kilowatts of generating capacity was installed in Lan-chou in 1951, 64/ and a small hydroelectric installation of not more than 200 kilowatts was placed in operation in 1952. 65/ Present (1954) capacity in Lan-chou does not exceed 2,200 kilowatts.

A modern thermal electric power plant is scheduled for construction in Lan-chou together with additional plants in T'ai-yuan, Hsi-an, Ta-yeh, and Pao-t'ou. 66/ Construction is believed to have begun on the Lan-chou plant. 67/ A plant of 5,000-kilowatt capacity

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would appear as a reasonable installation for Lan-chou. This conclusion is based upon the recent construction of an estimated 10,000-kilowatt thermal plant in Hsi-an. 68/ A 10,000-kilowatt plant would be an absolute maximum for a plant constructed in Lan-chou in the immediate future.

4. Transportation.

Much of the increased economic importance of Lan-chou is not the result of major industrial construction but of improved transport facilities and increased petroleum exploitation at the Yu-men oil fields.

Lan-chou has long served as a hub for truck transport, with roads radiating outward to Sinkiang, Tibet, Ningsia, Shensi, and South China. The road system in this area, however, remains crude, although substantial road improvements have been made since 1950. Recently, railroad transport has displaced, to a large extent, through east-west truck traffic. The present trend is toward highway feeder lines joining the outlying districts of Kansu to the rail line at Lan-chou. 69/

The completion in August 1952 of the long-proposed westward extension of the Lung-hai railroad to Lan-chou marked the attainment of a major objective by the Chinese Communists. The next objective of the westward extension of the railroad from Lan-chou is Yu-men. Once this point is reached, a marked increase in the eastward shipment of petroleum products can be expected. The ultimate objective of railroad construction in Northwest China, however, is to secure an additional line of rail communication with the USSR, lessening Communist China's dependence upon vulnerable eastern railroad connections with Soviet industrial centers. In addition, completion of the railroad to Sinkiang will strengthen Communist China's political influence in this area and permit an equitable distribution of the petroleum or mineral resources that are being jointly exploited by the Russians and the Chinese Communists.

It has been estimated that the railroad should reach Yu-men (549 miles from Lan-chou) by mid-1955, Ti-hua (1,233 miles from Lan-chou) at the end of 1959, and the Soviet border near Ta-ch'eng (about 1,677 miles) early in 1962. 70/ If the Russians should take an active part in railroad construction in Sinkiang, it is probable that a connection between Communist China and the USSR would be

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achieved several years earlier. At present the railroad is north of Yung-teng, approximately 70 miles northwest of Lan-chou. 71/ In the long run, with ultimate rail connections with Chungking and Pao-t'ou, the importance of Lan-chou as a rail center will increase further.

Downstream from Lan-chou, the Yellow River is navigable only to inflated animal-skin rafts and to barges of shallow draft. 72/

III. Capabilities, Vulnerabilities, and Intentions.

A. Capabilities.

At present, Lan-chou is not significant as a manufacturing center for the engineering industry. The small-scale industry in Lan-chou is oriented toward the production of consumer goods, agricultural support, and area rail and truck transport.

Activities in Northwest China to be watched as indicators of industrial growth include continued and expanded railroad construction, new electric power installations, increased petroleum production and changes in the pattern of distribution of either crude or refined petroleum products, and new plant construction.

Up to the present time the Chinese Communists have stressed railroad construction more than other construction activities in Northwest China. An estimate of the stress placed upon the Northwest area will be possible after the completion of the railroad to Yu-men. An immediate westward extension of this line will indicate growing emphasis upon exploitation of natural resources in this area and upon the securing of an alternate line of rail communication with the USSR. It may also be indicative of a desire on the part of the Chinese Communists to increase their own influence in this sphere of Soviet influence. Additional railroad construction connecting Lan-chou with Hsi-ning, Chungking, or Pao-t'ou would indicate increased Chinese Communist capabilities.

The rate of installation of electric generating capacity in Northwest China will also serve as a measure of the industrial importance of this area. Industrial North and Northeast China are presently in the most advantageous position to achieve large-scale increases in generating capacity. Power installations in the interior can be expected to develop much more slowly. In the next decade Northwest China should claim an increasing percentage of newly

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installed generating capacity if Northwest China is to become of major industrial importance. This rate of increase can be indicative of the emphasis placed upon Northwest China by the Chinese Communists and can provide a measure of its future growth potential.

B. Vulnerabilities.

The modest industrialization program undertaken by the Chinese Communists in Northwest China suffers from a lack of electric power, undeveloped natural resources, inadequate transport, the dry climate, and lack of a technically trained labor force.

C. Intentions.

The present industrialization policy of Lan-chou can be expected to continue to stress the production of consumer goods, the increased utilization of regional agricultural products, and the continued production of construction materials. Increased production of hides, leather goods, animal casings, and food products probably will continue. Substantial modernization and increased productive capacity for the wool-processing and woolen textile industry is most likely.

During this period, general construction, including road improvements and commercial, residential, and industrial construction, as well as initial attention to water supply and sewerage problems, undoubtedly will continue.

Any substantial increase in the industrial output of Lan-chou, with the city becoming a modern industrial center, is dependent upon the installation of increased electric generating capacity. Industrially, Lan-chou is handicapped by inadequate and obsolescent power facilities. Although the Chinese are installing increased generating capacity in Lan-chou, it is doubtful that even a modest increase in capacity of several thousand kilowatts can be installed prior to 1955.

As the industrialization of Lan-chou progresses, it is probable that a small engineering industry concentration will be established. This industry, from present indications, will be oriented toward agricultural, water conservation, petroleum, and mining requirements. The beginning of a modern inland military production center in Lan-chou is a possibility.

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If adequate raw materials prove available, it is likely that a small iron and steel industry will be established in Lan-chou to meet local requirements. It is improbable that a major metallurgical center will be established in Lan-chou in the next 5 to 10 years.

Completion of the railroad to Yu-men will greatly facilitate the shipment of refined petroleum products and crude oil to eastern consumption centers. Lan-chou is the logical distribution point for southeastern Kansu, but because of its distance from the Yu-men and Sinkiang oil fields and the eastern consumption centers, it is doubtful if large-scale refinery facilities of national importance will be established in Lan-chou. The ultimate construction of a pipeline from the petroleum areas to Lan-chou would increase Lan-chou's potential for becoming a refinery center. Because of the distances involved and the adequacy of rail transport, the construction of a pipeline to Yu-men would not appear feasible for a period of at least 5 years.

Upon the completion of the Lan-chou - Sinkiang railroad, Lan-chou will be in a position to receive raw materials and industrial products from Sinkiang and the USSR. Commercial activities centering on Lan-chou as a gateway to Communist China will undoubtedly expand. The effect of continued improvements in irrigation, reforestation, transportation, agriculture, and exploitation of natural resources should have had a considerable effect upon the industrialization of Northwest China by 1960. The Northwest should by that time account for a considerably greater share of Communist China's national product.

By 1960, plants in Lan-chou should be capable of producing in modest quantities such items as water pumps, air compressors, textile machinery, metalworking cutting equipment -- including lathes of non-precision types, agricultural tools and farm machinery, and equipment for both the mining and the petroleum industries. Additional thermal power installations, large-scale automotive repair facilities, and railroad yard facilities, as well as greatly expanded woolen textile production, can be expected.

In the decade 1960-70 Lan-chou will develop the potential of becoming a major transportation, commercial, and industrial center in Communist China, although there is no reason to expect that Lan-chou will outstrip in industrial importance Shanghai, Mukden, T'ai-yuan, or other present-day industrial centers in North and Northeast China.

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APPENDIX A

TABLES

Table 2

Major Machinery and Metalworking Plants in Lan-chou
1944 g/* 73

Factory Name	Date Founded	Location	Capital (Thousand 1944 Yuan)	Production Equipment	Number of Workers	Annual Production
Kansu Machinery Plant	September 1941	T'umentun, Lan-chou	36,900	18 motors (135 total horsepower), 29 lathes, 9 planers, 5 scutching machines, 1 punch press, 5 drill presses, and 1 arc-welding machine.	416	Ten 6-foot lathe beds, ten 8-foot lathe beds, 5 shapers, 8 water pumps, 1 air compressor, 5 steelyards, 3 engines for raising and lowering sluice gates, 20 vises, and 33 hand drills.
Lan-chou Machinery Plant	7 July 1941	Ch'i-li ho, Lan-chou	500	4 motors (15-horsepower, 12-horsepower, 5-horsepower, 3-horsepower), 7 lathes, 3 planers, 1 scutching machine.	78	16 cotton scutchers, 1 flour milling machine, and 5 turning lathes.
Linshen Machinery Plant	July 1942	Imin Lu, Lan-chou	100	Three 6-foot lathe beds, 1 drill press, 1 sprayer, 1 electroplating machine.	17	Repair parts.
Chisheng Iron Works	August 1942	Ch'ung-shan Lu, Lan-chou	50	One 5-horsepower motor, 2 lathe beds, 3 vises, 1 drill press, 1 powered knife, 1 rotating drill.	29	2 cotton scutchers, 3 looms, 5 silver chests, 5 drill presses, 3 wool-beating machines, 5 vises.

* Footnotes for Table 2 follow on p. 20.

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Table 2

Major Machinery and Metalworking Plants in Lan-chou
1944 a/ 73/
(Continued)

Factory Name	Date Founded	Location	Capital (Thousand 1944 Yuan)	Production Equipment	Number of Workers	Annual Production
Chien-kuo Automobile Repair Shop (formerly Tansing Iron Works)	September 1943	Imin Lu	100	1 lathe, forge and auto- motive repair equipment.	27	100 sheets each of front and back steel plate, 200 copper sleeves, 1,000 screws.
Lan-chou Imin Lu Machinery Production Cooperative	January 1943	Imin Lu	70	Electric motors, oil motors, lathes, planers, drill press, scutching machines, and vises.	21	Wool spindles, wool com- bers, joining machines, flour milling machines, wool looms, wool scutchers, stocking knitters, cotton looms.
Lan-chou Industrial Association Iron Works	July 1940	Ho-chia-chuang, in the southern suburbs of Lan-chou	100	3 lathes, 1 planer, 2 drill presses, 7 vises, 2 forges, 1 set of cast- ing equipment.	30	2 wool combers, 1 revol- ving spinning machine, wool-washing machines, wool-beating machines, iron roller looms, and other parts.
Hohsi Industrial Company Iron Works	May 1944	325 Chungcheng Lu, Lan-chou	N.A.	3 turning lathes, 2 drill presses, 5 vises, 1 forge.	13	Parts for automobiles and other machinery.

a. Following World War II, because of the unstable economic and political conditions, there was little industrial activity in Lan-chou. This summary of the major metalworking plants is indicative of Lan-chou's industrial capabilities for as late a period as 1951.

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Table 3

Consumption of Iron by Major Industrial Plants in Kansu 74/
1944

<u>Name</u>	<u>Metric Tons</u> <u>Annual Consumption</u>
Kansu Machinery Plant	120
Lan-chou Machinery Plant	60
Lan-chou Power Plant	12
Northwest Highway Bureau Repair Shop	60
Plants under National Resources Commission	60
Northwest Highway Bureau	24
T-ien-shui Auto Repair Shop	24
Kansu Cement Company	24
Kansu Mining Company	25
N.A. -- small foundries in Lan-chou	120
N.A. -- farm implements and miscellaneous	300
Northwest Salt Administration Repair Shop	60

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Table 4

Location of Cities Mentioned in the Text of This Report a/

Alma-Ata, Kazakh SSR	43°12' N - 76°57' E
Chungking, Szechwan	29°34' N - 106°35' E
Hsi-an (Sian), Shensi	34°16' N - 108°54' E
Lan-chou, Kansu	36°03' N - 103°41' E
Mukden (Shen-yang), Liaotung	41°48' N - 123°27' E
Pao-t'ou, Suiyuan	40°36' N - 110°03' E
Shanghai, Kiangsu	31°03' N - 121°24' E
Chuguchak (T'a-ch'eng), Sinkiang	46°45' N - 82°57' E
T'ai-pei, Taiwan	25°03' N - 121°32' E
T'ai-yuan, Shansi	37°52' N - 112°33' E
Ta-yeh, Hupeh	30°05' N - 114°57' E
Ti-hua (Urumchi), Sinkiang	43°48' N - 87°35' E
Ulan-Bator, Mongolia	47°55' N - 106°53' E
Wu-su, Sinkiang	44°27' N - 84°37' E
Yu-men, Kansu	40°17' N - 97°12' E
Yung-teng, Kansu	36°44' N - 103°24' E

a. See the map, Communist China: Northwest Area, inside back cover.

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APPENDIX B

METHODOLOGY

Prior to the preparation of this report, there existed no definitive statement regarding the industrial capabilities of Lan-chou. Readily available information on Lan-chou was sketchy and conflicting. This study initially developed a "bench mark" picture of Lan-chou that would clearly define its industrial capacity and importance. The base established was for the period of 1944-50.

Information on Lan-chou since 1950 has been evaluated and collated in order to estimate the present industrial importance of the area. Reports of industrial developments in Lan-chou were too fragmentary to give conclusive evidence of the scope of recent industrial activities in the area. It was necessary to evaluate the interrelated effect of railroad construction, movements of skilled workers, commercial activity, and petroleum exploitation upon the industrialization of Lan-chou.

Estimates of Lan-chou's future industrial potential are based upon a review of factors that can be expected to restrict or accelerate its industrial growth. These included estimates of the probable impact upon Lan-chou of future transportation improvements, natural resource exploitation, past industrial capabilities of the area, and the trend of recent Chinese Communist industrial activity.

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APPENDIX C

GAPS IN INTELLIGENCE

I. General.

Concise information regarding recent industrial construction in Lan-chou, including data indicating the size, equipment, and productive capabilities of new industrial construction is lacking.

II. Specific.

Of considerable importance from an intelligence viewpoint is information that can supply positive indications of Chinese Communist intentions regarding the following:

A. Lan-chou's long-term role as a center for engineering industries.

B. Lan-chou's role in the development of the petroleum and mineral resources of the Northwest, and the impact of these developments on the extent and type of industry established in Lan-chou.

C. The impact of the Lan-chou - Sinkiang railroad upon the industrial development of Lan-chou.

Of immediate value would be an evaluation of Sino-Soviet activities in Sinkiang related to industrial activities in the Lan-chou area of the Northwest. Reported uranium mining and atomic activities, as well as known Sino-Soviet mineral and petroleum exploitation and industrial plant construction, have made this area of considerable intelligence interest.

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APPENDIX D

SOURCES AND EVALUATION OF SOURCES

1. Evaluation of Sources.

Information regarding Chinese Communist operations and intentions in Northwest China has been fragmentary. The Chinese Communist press and radio have reported railroad and highway construction, reforestation, and reclamation projects in considerable detail and have been generally reliable. Petroleum and mineral exploitation in this area has been discussed in much more general terms. Chinese Communist statements detailing industrial transfers and expansions in Lan-chou have been almost totally lacking.

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Recent information regarding economic activities in Lan-chou has depended upon CIA SO (CS) sources and Army, Air, and State [REDACTED] and a few Japanese coming out of the Northwest area. The CIA sources have been fragmentary and often tend to over-emphasize the short-range industrial importance of Lan-chou and Northwest China. [REDACTED]

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[REDACTED] However, some of these latter reports have supplied valuable general information on Lan-chou.

Background information on the industrial significance of Lan-chou was obtained in most part from the exploitation of previously unavailable Chinese documents. Industries in Kansu, 1944 was of major importance in detailing and confirming the fragmentary picture of a "bench mark" Lan-chou. For this same purpose, Japanese documents and China Project reports were of considerable value.

Basic intelligence reports, such as NIS-39, Terrain Study No. 5, North Central China, and basic Australian intelligence reports supplied valuable information regarding the general physical and economic characteristics of the area. These reports, however, were not of value in defining the specific industrial capabilities of Lan-chou. Material in the Industrial and Biographical Registers reflects the general lack of information that is available on this part of the world.

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2. Sources.

Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
A - Completely reliable	Doc. - Documentary
B - Usually reliable	1 - Confirmed by other sources
C - Fairly reliable	2 - Probably true
D - Not usually reliable	3 - Possibly true
E - Not reliable	4 - Doubtful
F - Cannot be judged	5 - Probably false
	6 - Cannot be judged

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which will carry the field evaluation "Documentary" instead of a numerical grade.

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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